

# Contents Volume 119

## 119 (1/2)

Announcements .....	v
High precision U-Pb ages for granulite metamorphism and deformation in the Archean Kapuskasing structural zone, Ontario: implications for structure and development of the lower crust	
T.E. Krogh .....	1
Microscale isotopic zonation in graphite crystals: Evidence for channelled CO <sub>2</sub> influx in granulites	
M. Santosh and H. Wada .....	19
Solubilities of carbon dioxide and water in rhyolitic melt at 850°C and 750 bars	
J.G. Blank, E.M. Stolper and M.R. Carroll .....	27
Variability of trace elements in basaltic suites	
P. Schiano, C.J. Allègre, B. Dupré, E. Lewin and J.-L. Joron .....	37
Evolution of the lithosphere beneath Oahu, Hawaii: rare earth element abundances in mantle xenoliths	
G. Sen, F.A. Frey, N. Shimizu and W.P. Leeman .....	53
Highly permeable and layered Jurassic oceanic crust in the western Pacific	
R.L. Larson, A.T. Fisher, R.D. Jarrard, K. Becker and Ocean Drilling Program Leg 144 Shipboard Scientific Party .....	71
Volcanic eruption of the mid-ocean ridge along the East Pacific Rise crest at 9°45'–52'N: Direct submersible observations of seafloor phenomena associated with an eruption event in April, 1991	
R.M. Haymon, D.J. Fornari, K.L. Von Damm, M.D. Lilley, M.R. Perfit, J.M. Edmond, W.C. Shanks, III, R.A. Lutz, J.M. Grebmeier, S. Carbotte, D. Wright, E. McLaughlin, M. Smith, N. Beedle and E. Olson .....	85
A 4300 year strontium isotope record of estuarine paleosalinity in San Francisco Bay, California	
B.L. Ingram and D.J. DePaolo .....	103
Simple models for the geochemical response of the ocean to climatic and tectonic forcing	
F.M. Richter and K.K. Turekian .....	121
Fluid flow in deep-sea carbonates: estimates based on porewater Sr	
F.M. Richter .....	133
Provenance of dust in the Pacific Ocean	
S. Nakai, A.N. Halliday and D.K. Rea .....	143
<sup>60</sup> Fe in eucrites	
A. Shukolyukov and G.W. Lugmair .....	159
Inversion of combined gravity and bathymetry data for crustal structure: A prescription for downward continuation	
J. Phipps Morgan and D.K. Blackman .....	167
Did Deccan volcanism pre-date the Cretaceous/Tertiary transition?	
T.R. Venkatesan, K. Pande and K. Gopalan .....	181
Pressure and temperature dependence of P- and S-wave velocities, seismic anisotropy and density of sheared rocks from the Sierra Alpujata massif (Ronda peridotites, Southern Spain)	
H. Kern and J.M. Tubia .....	191
Impact-induced phase transformations at 50–60 GPa in continental crust: an EPMA and ATEM study	
I. Martinez, U. Schärer and F. Guyot .....	207

## 119 (3)

Palaeomagnetic rotations in the eastern Betic Cordillera, southern Spain	
S. Allerton, L. Loneragan, J.P. Platt, E.S. Platzman and E. McClelland .....	225
Analysis of NRM directions from the Rossello composite: implications for tectonic rotations of the Caltanissetta basin, Sicily	
P.J.J. Scheepers and C.G. Langereis .....	243
Discordance of Jurassic paleomagnetic data from south China and their tectonic implications	
S.A. Gilder, X. Zhao, R.S. Coe, H. Wu and G. Kuang .....	259
A noble gas study of a granulite sample from the Nilgiri Hills, southern India: implications for granulite formation	
T.J. Dunai and J.L.R. Touret .....	271
Carbonated peridotite xenoliths from Spitsbergen: implications for trace element signature of mantle carbonate metasomatism	
D.A. Ionov, C. Dupuy, S.Y. O'Reilly, M.G. Kopylova and Y.S. Genshaft .....	283

Nd isotopic evidence for transient, highly depleted mantle reservoirs in the early history of the Earth V.C. Bennett, A.P. Nutman and M.T. McCulloch	299
Helium isotope ratios in Easter microplate basalts R.J. Poreda, J.-G. Schilling and H. Craig	319
Forces associated with mantle plumes R. Westaway	331
Thermal anomalies beneath the Australian–Antarctic discordance B.-Y. Kuo	349
Silica and germanium in Pacific Ocean hydrothermal vents and plumes R.A. Mortlock, P.N. Froelich, R.A. Feely, G.J. Massoth, D.A. Butterfield and J.E. Lupton	365
A diffusion-limited aggregation model for the evolution of drainage networks J.G. Masek and D.L. Turcotte	379
Contributions of wood ash magnetism to archaeomagnetic properties of fire pits and hearths R.G. McClean and W.F. Kean	387
Ages of the second caldera of Piton de la Fournaise volcano (Réunion) determined by cosmic ray produced $^3\text{He}$ and $^{21}\text{Ne}$ T. Staudacher and C.J. Allègre	395
Cosmogenic neon and helium at Réunion: measurement of erosion rate P. Sarda, T. Staudacher, C.J. Allègre and A. Lecomte	405
Impact-shocked zircons: discovery of shock-induced textures reflecting increasing degrees of shock metamorphism B.F. Bohor, W.J. Betterton and T.E. Krogh	419
Fingerprinting the K/T impact site and determining the time of impact by U–Pb dating of single shocked zircons from distal ejecta T.E. Krogh, S.L. Kamo and B.F. Bohor	425
Planar lamellar substructures in quartz J.B. Lyons, C.B. Officer, P.E. Borella and R. Lahodinsky	431
Geochemistry and mineralogy of Early Archean spherule beds, Barberton Mountain Land, South Africa: evidence for origin by impact doubtful C. Koeberl, W.U. Reimold and R.H. Boer	441

### *Express Letter*

Extraterrestrial component associated with Australasian microtektites in a core from ODP Site 758B C. Koeberl	453
--	-----

### **119 (4)**

O, Sr, Nd and Pb isotopic composition of the Kasuga Cross-Chain in the Mariana Arc: A new perspective on the K–h relationship R.J. Stern, M.C. Jackson, P. Fryer and E. Ito	459
Cycling of sulfur in subduction zones: The geochemistry of sulfur in the Mariana Island Arc and back-arc trough J.C. Alt, W.C. Shanks III and M.C. Jackson	477
Hf isotope composition of late Cenozoic basaltic rocks from northwestern Colorado, USA: New constraints on mantle enrichment processes B.L. Beard and C.M. Johnson	495
The compositions of primary carbonate melts and their evolution through wallrock reaction in the mantle J.A. Dalton and B.J. Wood	511
Near-primary melt inclusions in anorthite phenocrysts from the Galapagos Platform C.W. Sinton, D.M. Christie, V.L. Coombs, R.L. Nielsen and M.R. Fisk	527
Implications of geochemical fronts in the Notch Peak contact-metamorphic aureole, Utah, USA P.I. Nabelek and T.C. Labotka	539
Preservation of $\delta^{18}\text{O}$ values of fluid inclusion water in quartz over geological time in an epithermal environment: Beregovo deposit, Transcarpathia, Ukraine M.O. Vityk, H.R. Krouse and Y.N. Demihov	561
The origin of chromitic chondrules and the volatility of Cr under a range of nebular conditions A. Krot, M.A. Ivanova and J.T. Wasson	569
Pliocene uplift of the eastern Iberian margin: Inferences from quantitative modelling of the Valencia Trough M.E. Janssen, M. Torné, S. Cloetingh and E. Banda	585

Paleomagnetism of the Red Lake greenstone belt, northwestern Ontario: Possible evidence for the timing of gold mineralization V. Costanzo-Alvarez and D.J. Dunlop .....	599
Geoid effects of lateral viscosity variation near the top of the mantle: A 2D model M.A. Ravine and J.P. Morgan .....	617

#### *Discussion*

Comment on 'Content and isotopic composition of sulphur in ultramafic xenoliths from central Asia' by D.A. Ionov, J. Hoefs, K.H. Wedepohl and U. Wiechert J.P. Lorand .....	627
Content of sulphur in different mantle reservoirs: Reply to comment on the paper 'Content and isotopic composition of sulphur in ultramafic xenoliths from central Asia' D.A. Ionov, J. Hoefs, K.H. Wedepohl and U. Wiechert .....	635

#### *Erratum*

Dikes vs. diapirs in viscoelastic rock A.M. Rubin .....	641
<b>Author Index Volumes 113-119</b> .....	661
<b>Contents Volume 119</b> .....	677